

Notice of Allowability

Application No.

09/994,926

Examiner

Sudhanshu C. Pathak

Applicant(s)

ROH, DONG-WOOK

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to August 11th, 2005.
2. ☒ The allowed claim(s) is/are 1-22.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date Sept. 26th, 2005.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

1. Claims 1-to-22 are pending in the application.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Joanna K. Mason on September 26th, 2005.

In order to avoid a 112 2nd Paragraph, the following claims have been amended.

➤ **Replace Claim 1 with:**

A method for generating orthogonal spread codes in a mobile communication system, comprising:

generating a first square matrix having a size of powers of 2 by operating an initial 2x2 matrix;

generating a second square matrix of same size of the first square matrix by operating the first square matrix;

composing a third square matrix of double size of the first square matrix, arranging the second square matrix as a first quarter matrix of the third square matrix, wherein the third square matrix is composed by arranging the first square matrix as a second quarter matrix and a third quarter matrix of the thirds square matrix, and arranging the second square matrix as a fourth quarter matrix of the

third square matrix by multiplying all elements of the second square matrix by -1;
making a deformed matrix by inserting a zero vector between a column
or a row of the third square matrix; and
generating orthogonal spread codes for channel discrimination from the
rows or columns of the deformed matrix.

➤ In Claim 3, line 2 **replace**

"...making a deformed matrix..." **with**

"...making the deformed matrix..."

➤ In Claim 4, line 2 **replace**

"...making a deformed matrix..." **with**

"...making the deformed matrix..."

➤ **Replace Claim 6 with:**

The method according to claim 5, wherein the first row of the first 4X4 square matrix is generated by positioning the first row of the initial 2x2 matrix in the two leftmost positions of the first row of the first 4X4 square matrix, and positioning the second row of the initial 2x2 matrix in the two rightmost positions of the first row of the first 4X4 square matrix.

➤ **Replace Claim 7 with:**

The method according to claim 6, wherein the second row of the first 4X4 square matrix is generated by positioning the first row of the initial 2x2 matrix in the two leftmost positions of the second row of the first 4X4 square matrix, and positioning the second row of the initial 2x2 matrix with the opposite symbol applied

in the two rightmost positions of the second row of the first 4X4 square matrix.

➤ **Replace Claim 8 with:**

The method according to claim 6, wherein the third row of the first 4X4 square matrix is generated by positioning the first row of the initial 2x2 matrix in the two rightmost positions of the third row of the first 4X4 square matrix, and positioning the second row of the initial 2x2 matrix in the two leftmost positions of the third row of the first 4X4 square matrix.

➤ **Replace Claim 9 with:**

The method according to claim 6, wherein the fourth row of the first 4X4 square matrix is generated by positioning the first row of the initial 2x2 matrix with the opposite symbol applied in the two rightmost positions of the fourth row of the first 4X4 square matrix, and positioning the second row of the initial 2x2 matrix in the two leftmost positions of the fourth row of the first 4X4 square matrix.

➤ **Replace Claim 11 with:**

A method for generating orthogonal spread codes in a mobile communication system comprising the steps of:

operating an initial square matrix having a size of powers of 2 to generate a first square matrix two times larger than the initial square matrix;

operating the first square matrix to generate a second square matrix;

arranging the second square matrix as a first quarter matrix, arranging the first square matrix as a second quarter matrix and a third quarter matrix, and arranging the second square matrix as a fourth quarter matrix by multiplying all

elements thereof with -1 to generate a third square matrix;

inserting a zero vector at least one row or column of the third square matrix to compose a deformed matrix; and

generating orthogonal spread codes for channel discrimination from the rows or columns of the composed matrix.

➤ In Claim 13, line 2 **replace**

"...making a deformed matrix..." **with**

"...making the deformed matrix..."

➤ In Claim 13, line 3 **replace**

"...or the rear..." **with**

"...or at the rear..."

➤ In Claim 13, line 4 **replace**

"...square matrix in..." **with**

"...square matrix..."

➤ In Claim 14, line 2 **replace**

"...making a deformed matrix..." **with**

"...making the deformed matrix..."

➤ **Replace** Claim 16 **with:**

The method according to claim 15, wherein the first row of the first square matrix, which is two times larger than the initial square matrix, is generated by positioning the first row of the initial square matrix in the leftmost positions, and positioning the second row of the initial square matrix in the rightmost positions of

the first row of the first square matrix, which is two times larger than the initial square matrix.

➤ **Replace Claim 17 with:**

The method according to claim 16, wherein the second row of the first square matrix, which is two times larger than the initial square matrix, is generated by positioning the first row of the initial square matrix in the leftmost positions and multiplying the second row of the second row of the initial square matrix by -1, and then positioning it in the rightmost positions of the second row of the first square matrix, which is two times larger than the initial square matrix.

➤ **Replace Claim 18 with:**

The method according to claim 16, wherein the third row of the first square matrix, which is two times larger than the initial square matrix, is generated by positioning the first row of the initial square matrix in the rightmost positions and positioning the second row of the initial square matrix in the leftmost positions of the third row of the first square matrix, which is two times larger than the initial square matrix.

➤ **Replace Claim 19 with:**

The method according to claim 16, wherein the fourth row of the first square matrix, which is two times larger than the initial square matrix, is generated by multiplying the first row of the initial square matrix by -1 and positioning it in the rightmost positions and positioning the second row of the initial square matrix in the leftmost positions of the fourth row of the first square matrix, which is two times

larger than the initial square matrix.

➤ **Replace Claim 22 with:**

A method for generating orthogonal spread codes in a mobile communication system, comprising:

operating an initial 2x2 matrix to generate a first square matrix having a size of powers of 2;

operating the first square matrix to generate a second square matrix;

arranging the second square matrix as a first quarter matrix;

arranging the first square matrix as a second quarter matrix and a third quarter matrix;

applying a minus symbol to all elements of the second square matrix to generate a fourth quarter matrix;

composing a third square matrix by taking the first to fourth quarter matrices as quarter matrices of the third square matrix;

inserting zero column vectors among certain columns of the third square matrix to compose a target matrix; and

taking rows of the target matrix to generate orthogonal spread codes for channel discrimination.

Allowable Subject Matter

3. Claims 1-22 are allowable over the prior art of record because the cited references do not contain the specified limitation of a method for generating orthogonal spread codes in a mobile communication system, comprising:

generating a first square matrix having a size of powers of 2 by operating an initial 2x2 matrix; generating a second square matrix of same size of the first square matrix by operating the first square matrix; composing a third square matrix of double size of the first square matrix, arranging the second square matrix as a first quarter matrix of the third square matrix, wherein the third square matrix is composed by arranging the first square matrix as a second quarter matrix and a third quarter matrix of the thirds square matrix, and arranging the second square matrix as a fourth quarter matrix of the third square matrix by multiplying all elements of the second square matrix by -1; making a deformed matrix by inserting a zero vector between a column or a row of the third square matrix; and generating orthogonal spread codes for channel discrimination from the rows or columns of the deformed matrix.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.
 - If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)-272-3056
 - The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak
September 28th, 2005



SHUWANG LIU
PRIMARY EXAMINER